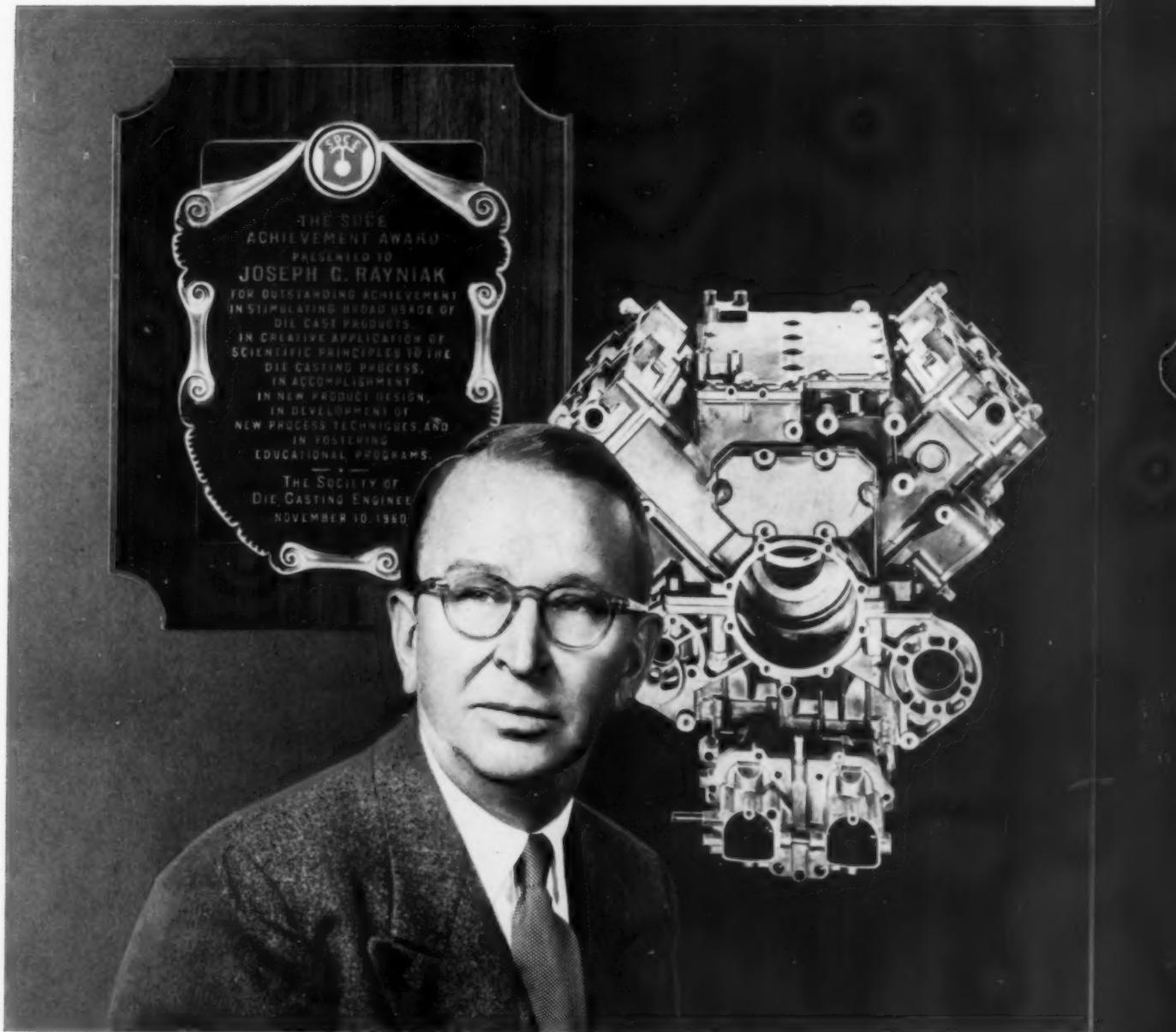




DIE CASTING ENGINEER

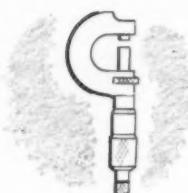
PUBLICATION OF THE SOCIETY OF DIE CASTING ENGINEERS / MARCH 1961



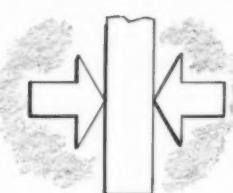
THE RAYNIAK STORY *is this issue's special feature . . . page 9*



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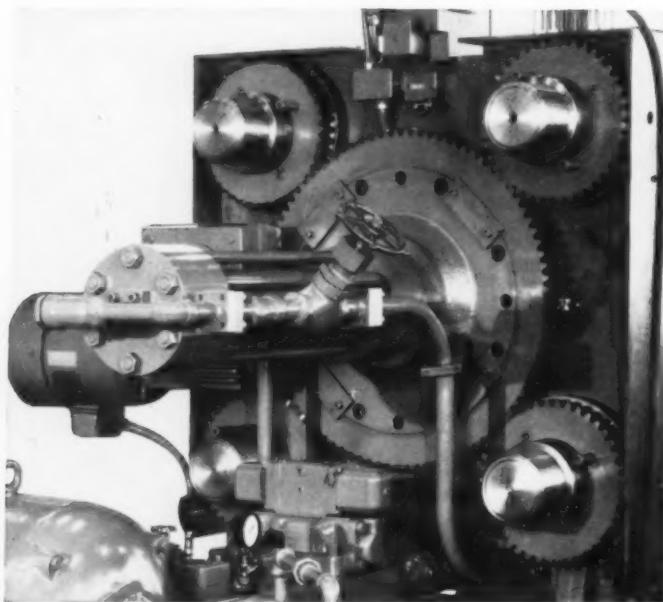


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DIE CASTING ENGINEER

THE SOCIETY OF DIE
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MARCH 1961

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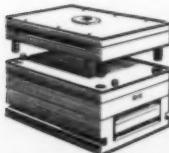
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John L. MacLaren

PRESIDENT'S REPORT

ON FEBRUARY 17, the first meeting of the year of the National Board of Directors of the Society of Die Casting Engineers was held in Detroit, with full attendance by Chapter representatives. Many decisions were made which will affect the future conduct of Society affairs, particularly in the area of expansion.

A revised Constitution and a new set of By-Laws were reviewed closely and adopted. These will be sent to all members as soon as they can be printed. The office of Secretary-Treasurer has been split, with Lee G. Axford the new Treasurer, and M. R. Tenenbaum, formerly Secretary-Treasurer, the Secretary. It is anticipated that this division of responsibility between two highly qualified and dedicated workers will be reflected in considerably more efficient performance of duties.

Because of the financial success of the 1960 Show and other undertakings, the Society has never been more solvent. The Directors have approved the formation of a Planning Committee to develop future programs for the furtherance of the Society's objectives. Now that we have funds, we intend to put them to good use in promoting knowledge and understanding of the die casting process.

In the past few years some excellent work has been done on Standards. This activity will be resumed with the issuance, in printed form, of standards already formulated.

The drive for membership will receive a boost from a new Membership Folder which will soon be mailed to the Chapters. The Directors have authorized an investigation into the most favorable locations for new Chapters. Thus the year should see the Society grow importantly in geographical scope. The Detroit Chapter has assumed responsibility for the publication of a Chapter Operating Manual, which should be of considerable assistance to new and existing Chapters alike.

Finally, the dates for the next Show, as explained elsewhere in this issue, have been set. The Society is "on the march" on all fronts—there is no doubt what-

soever that an exciting future is assured. Won't you take part personally in this growth by attending Chapter meetings regularly, by inviting your die casting friends to meetings, by volunteering for service on committees, by running for office yourself?

LEE AXFORD NAMED NATIONAL TREASURER



Lee G. Axford

LEE G. AXFORD was elected National Treasurer of the Society of Die Casting Engineers, effective March 1, 1961, at a recent Board of Directors meeting.

Mr. Axford, a veteran die caster, brings to this position a background in many different types of foundry operations. His past associations include General Motors Corporation, Chrysler Corporation, Michigan Die Casting Company, and Odel Die Casting Company. He is currently Manufacturing Engineer with the Engine and Foundry Division, Ford Motor Company, Dearborn, Michigan.

Mr. Axford served as 1960 Chairman of the Detroit Chapter and Floor Manager of the first National Die Casting Exposition.

The former National Secretary-Treasurer, M. R. Tenenbaum, will continue as Secretary, beginning March 1.

NATIONAL PROGRAM DIRECTOR APPOINTED

HARRY A. HARTLEY, Detroit Sales Representative for Ajax Magnathermic Corporation, has been appointed SDCE National Program Director.

He will act as coordinator at the National Office level in assisting the Chapter program chairmen in setting up their monthly meetings. Mr. Hartley's efforts should bring the best speakers available, on the most interesting and meaningful subjects, to the Chapters of the Society.



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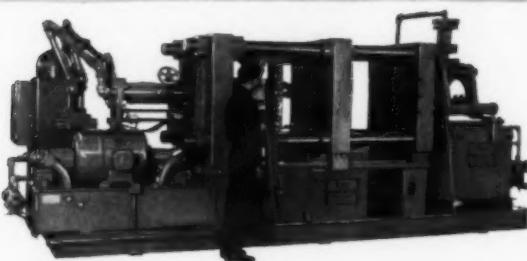
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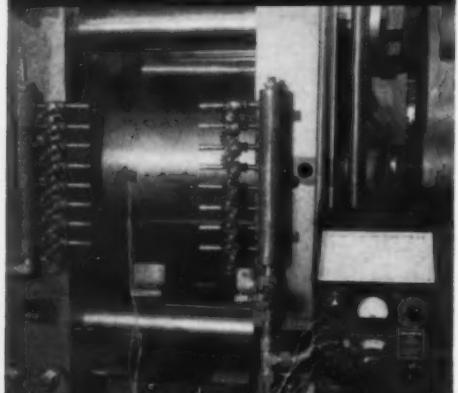
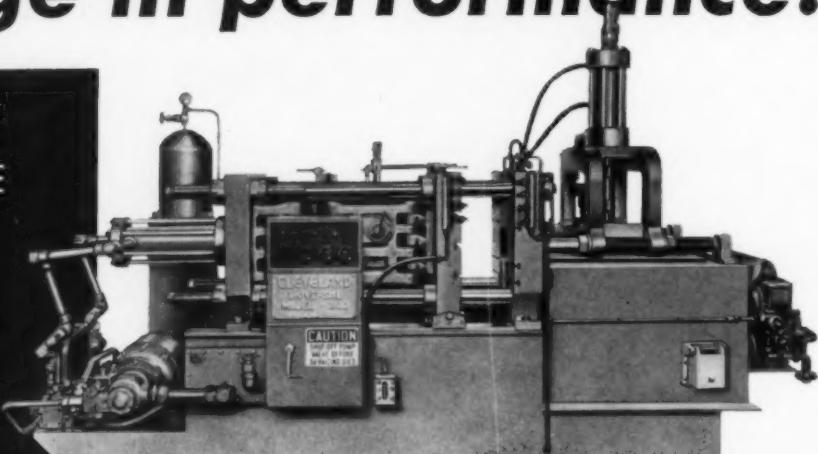
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★ Cleveland Die Casting Machine being tested for clamping capacity using SDCE calibrated test ring method.

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Among its many features are: 3½" dia. alloy steel tie bars . . . 29" x 31" die plates with 5¼" thick movable platen . . . adjustable die stroke—accommodates dies from 4" to 19" in thickness . . . extra-rugged toggle mechanism . . . large capacity Vickers hydraulic pumps driven by 15 hp motor—provide high injection speed and "squeeze" to the shot . . . plus many other construction qualities that have made the name "Cleveland" on die casting machines stand for reliability and economy in quality castings production.

You can look to Cleveland to meet your die casting machine needs exactly. Builders of a complete line of strain gauge tested machines in 100, 200, 400, 650, 850, 1000 and 2000 ton capacities. Call in a Cleveland sales engineer, or write direct, for detailed information. Better still, schedule your visit to Cleveland's Development Center to see the latest advances in fully automated and vacuum die casting.

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THE RAYNIAK STORY

JOHN L. MacLAREN

EARLY this year the resignation of Joseph G. Rayniak as Vice Chairman of the Board of Outboard Marine Corporation was announced, concluding a phase in the career of a man who has probably made a greater personal contribution to the growth in acceptance of products made from die castings than any other. Mr. Rayniak's active interest in industry is by no means ended, however, for his services continue to be available to his company as a Director and Consultant. His genius for finding a method to make a product better and cheaper will undoubtedly find further expression in the years ahead.

Born in Czechoslovakia, Mr. Rayniak came to this country at the turn of the century as a child. After completing a four year apprentice program, during which he studied mechanical engineering at night school, he obtained employment at the firm which was the forerunner of Studebaker Corporation. He later worked for several other companies in Michigan and Ohio, acquiring skills in metal pattern work, making cores, molds and castings. This experience was invaluable years later when it came to making die castings.

After several years in tool engineering at such automobile manufacturing companies as Packard, Duesenberg and Willys-Overland, Mr. Rayniak became factory manager in 1920 of Johnson Motor Wheel Company, South Bend, Indiana. The company produced gasoline-powered bicycles and had manufacturing problems. He helped to solve these and then turned his attention to production of a new type of engine for boat propulsion. The first outboard motor, rated at two horsepower, made its appearance in December, 1921.

This motor made ample use of aluminum to take advantage of desirable physical and chemical properties. In the beginning, castings in aluminum were crude by today's standards. Due to Mr. Rayniak's inquisitiveness, his dissatisfaction with existing production methods and levels of quality, and his willingness to take a financial risk, the outboard motor has been gradually refined to its present highly developed state.

Improvements in lightness, power output and efficiency are largely attributable to incorporation of skillfully designed and produced aluminum die castings. The die casting program at Outboard Marine (as the company became known in the 1930's) was launched with the installation of the first machine in 1939 when Mr. Rayniak was Vice President, Manufacturing. The corporation has since installed 119 machines, making it one of the biggest producers of aluminum die castings in the world.

In his executive career at Outboard Marine Mr. Rayniak has successively been Executive Vice President and General Manager, President and finally, in 1959, Vice Chairman of the Board. He has received many honors during this period, the most recent of which was the Society of Die Casting Engineers' newly instituted Achievement Award.

The Award was conceived by the Society as recognition for the man who has achieved outstanding status in the stimulation of broad usage of die cast products, creative application of scientific principles to the process, accomplishment in new product design, development of new process techniques, and in the encouragement of educational programs. It is fitting



Joseph G. Rayniak receiving the first SDCE Achievement Award from President Ollie Clayton.

that such a man of vision, ingenuity and accomplishment as Joseph G. Rayniak should have been its first recipient.

EDITOR'S NOTE: Mr. Rayniak told the story of die casting usage at Outboard Marine Corporation, a long range development with which he is intimately identified, when he addressed the banquet held on November 10, 1960 in conjunction with the First National Die Casting Exposition and Congress. As it is an essential part of "The Rayniak Story," the speech is reproduced below as delivered in Detroit.

HOW DIE CASTING BUILT AN INDUSTRY

By Joseph G. Rayniak

A NUMBER of years prior to World War II, it became apparent that the outboard motor and marine industry was on the threshold of a new era. Statistical surveys revealed that in years to come there would be steadily increasing consumer demand for outboard motors. With expanded markets and trends toward the larger engines, new methods of fabrication and mass production were mandatory.

Die castings used on outboard motors at this period were very limited, consisting of an occasional knob or handle. Most of the functional parts were either permanent mold or sand cast. Gradually, to take advantage of the economics of weight, intricate design and reduced machining cost, Johnson engineers began incorporating additional die castings into the engines.

All of these early day castings were purchased from the jobbing industry. There were many problems that resulted with the increased use of die castings in the engines; problems of delivery, inventory, engineering and most important of all, quality control. In view of these adversities, it was decided that the success of the entire business might well lie in the solution of the die casting problems.

Since the principal problem with the purchased die castings was inconsistent quality, this was the major reason for Johnson Motors entering into the die casting industry. Secondly, having the casting plant integrated with machining and assembly operations could reduce the cost of the finished product substantially. So it was, in 1939, that the first die cast machine was installed in the Johnson Motors plant.

Since that time, it has been the goal of the Johnson Division to remove some of the art from die casting and replace it with science. Basic advances toward this goal resulted in the adoption of the electric induction melting furnace and the solid frame die cast machine. The electric induction furnace provided increased accuracy for metal temperature control down to five degrees plus or minus and reduced heat loss and fumes in the area of the die cast machines. The solid frame die cast machine has a construction form which we feel is desirable for our class of work where large die castings of maximum density are required. These machines retained their original built-

in accuracy and maintained precision die alignment consistently over years of production service.

Presently at Johnson Motors, Gale Products, Lawn-Boy, and the Canadian operation, we have a total installation of 119 die cast machines and 147 furnaces, of which 28 are melting furnaces. Through these furnaces and die cast machines are processed four million pounds of finished castings monthly.

Approximately 50 per cent of all new dies required yearly are built in the Johnson Motors tool room. The number of dies processed through the tooling division in any given year depends on available time between engineering releases and production requirements. Because of the tremendous pressures on the die cavities, and the variety of large intricate castings produced at the Johnson Division, it was deemed necessary to build dies that were more ruggedly constructed than any previously built, using the finest tool steels. Design standards have been developed to keep die construction uniformly high in quality.

A competent staff, composed of designers, engineers and production supervisors, carefully check each design prior to release to the die shop. This same group makes an analysis of all casting designs for proper gating and venting prior to designing the die. This insures a completed die that has been engineered for proper performance and ultimately high quality production.

In 1954 a new modern building was constructed to house the die casting operation. This new building was especially designed for die casting, incorporating such features as improved lighting, ventilation, bridge cranes, and an overhead monorail hot metal system. A tempered water system for die heating or cooling was installed in the new building. More recent developments incorporated are the use of vacuum in the casting process and electrical resistance heating of dies.

USES VACUUM

A variety of designs have been used in applying vacuum to our die casting dies. It has been our experience that no single design or system can be applied to all dies and all castings successfully. On some dies we have sealed off and evacuated the entire ejector box, while on others we have sealed off the ejector pins and evacuated the cavity only. Vacuum has greatly enhanced our casting of the aluminum magnesium alloy #218. It has resulted in better surface finish, greater density and improved fill-out on thin wall sections. We have applied this alloy to propellers and various other functional parts where improved physical properties above standard die casting alloys are required.

Die warm-up has long been a problem which has plagued the die casting industry. Dies receive serious abuse from uneven heating, resulting in cracked cavities and premature heat checking. Much scrap and wasted time is generated in the average plant due to making "warm-up" shots.

To eliminate some of these problems, we have in-

stalled automatic thermostatic-controlled, electric resistance heaters in a number of our dies. These heaters have important advantages over conventional heating methods. More even heating of the die to a pre-determined temperature makes it ready for immediate production when the machine operators report at the beginning of each week. The heaters, once installed, require little or no labor, merely turning on the switch and setting the control to the desired temperature.

SCIENCE REPLACES "ART"

In working toward our goal, to remove some of the art from die casting and replace it with science, it was found necessary to maintain records to enable die and machine to accurately duplicate all conditions pertinent to the die casting process on successive production runs. Written procedures for machine operation, die set-up and inspection were established. Educational programs for die cast machine operators and set-up men were formulated.

In our operating procedure that accompanies the die to the die cast machine on each production run are recorded such data as: alloy specification, metal temperature, die temperature, plunger speed, hydraulic pump pressures, die lubrication procedure, holding time, and die open cycle time. With this information available it is a relatively simple matter for the set-up man to make adjustments once the die is installed in the machine.

Early in our die casting experience it was observed that some operators would leave their machines for an extended period of time, frequently allowing cooling water to circulate through the die during this absence. Upon returning and resuming the casting operation, operators required 15 or 20 casting cycles to again bring the die to the proper operating temperature. In addition to the obvious scrap this condition generates, a certain number of castings that outwardly appear normal, are actually sub-standard due to inconsistencies in grain structure and density.

These castings represent possible field failures and a serious quality hazard if they are assembled into the product.

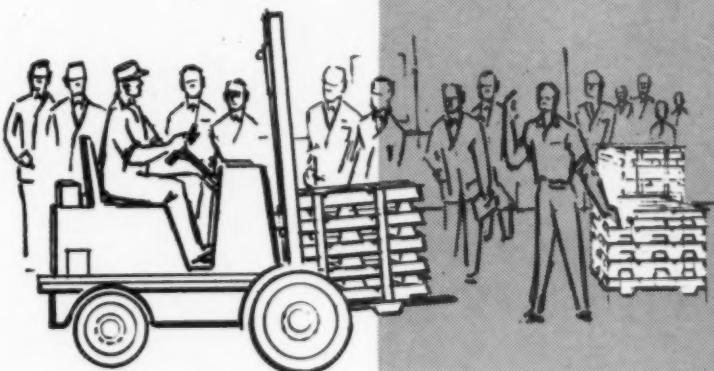
To eliminate this condition a program was formulated to keep a die running continually once production had started. To accomplish this, the machines must operate 24 hours per day, on a three-shift basis. During lunch and personal periods the machines are run by the set-up men. This procedure elimi-

nates, to a large degree, intermittent operation of the machines with the resultant inconsistencies of die temperature and ultimately poor quality castings.

QUALITY CONTROL

Quality control in the die casting operation begins with the raw material and is under the supervision of the Metallurgical Laboratory. The aluminum that is proc-

(Continued on Page 26)



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C. F. CHRISTOPHER

CASE FOR CAST DIE HOLDERS

IN THE die holder industry, steel forgings have been used almost exclusively in the past as the basic building block. The idea of using instead a cast steel building block has been difficult to sell because the quality and economy aspects of this approach had not, until recently, been adequately assessed. However, in the past few years, concentrated research has proven the economy, versatility of design, flexibility in composition and service performance of high quality steel castings. As a result, many modern foundries today are producing castings which, in virtually every way are more than competitive with the forged product.

As far as the die casting industry is concerned, the governing factors in the construction of dies and die holders are production cost and metallurgical and physical quality. These factors can be broken down into such considerations as machinability of the stock, amount of stock to be removed by machining, strength and creep at room and elevated temperatures, wear resistance, and metallurgical consistency.

A die holder must be hard and strong to withstand high operating pressures and also retain original dimensions. When forgings are used, extensive rough machining must be performed prior to hardening due

Mr. C. F. Christopher is a research metallurgist for the Blaw-Knox Company (East Chicago, Indiana plant), with which he has been associated since 1943, when it was known as the Continental Foundry & Machine Company. A metallurgical engineering graduate of the University of Pittsburgh (1923), he was with Jones & Laughlin Steel Company (1923-1928), on the research faculty of Carnegie Institute of Technology (1928-1934), with the American Locomotive Company (1934-1940), and the Steel Company of Canada (1940-1943).

to the inability of the forging process to reduce the stock to intricate, pocketed, close tolerance shapes. This procedure can be prohibitively expensive in terms of cost and processing time, particularly where several parts of the same design must be produced.

On the other hand, if steel castings of acceptable quality are substituted for forgings, the holder can be cast almost to shape, and the high machining cost factor associated with forgings can be reduced significantly. In volume production of a particular holder, the cost saving is of course compounded many times.

Die steels can and are being cast in foundries to close commercial tolerances, hardened to the required degree, and then finish machined. With proper planning, the removal of stock should not greatly exceed one-half inch in depth. Of course, good machining practices and sharp tools must be employed when cutting steel in the 300 Brinell hardness range.



Figure 1. Cast holder for large engine block die. Note the prominent posts which would be impossible to reproduce closely by forging.

Physical properties of a component made from die steel are the same whether the forging or casting process has been used. Creep, hardenability, hardness, structural composition, machinability and other properties are all strictly a matter of chemical composition and heat treatment procedures. Constituents such as nickel, molybdenum, chromium, carbon and manganese all impart the same attributes to steel castings and forgings alike. Therefore, when the manufacturer must make a decision on the suitability of a particular steel for use as a die holder, the prime consideration is steel composition and heat treatment. Naturally, once the material has been selected, the most economic conversion process from raw material to rough shape should be chosen.

The steels in principal use today for forged die holder blocks are types 4140 and 4340. Both of these compositions are sufficiently hardenable in either the forged or cast state to yield the high surface hardness needed. However, they are oil quenching types. As oil is a slow quenching medium, heat will be removed

through the surface at a rate which will promote hardness to a limited depth only. The hardened surface will be tough and machinable, but under this fairly thin layer, the slowly quenched mass will gradually develop into a hard, brittle and practically unmachinable structure. Water quenching of type 4140 and 4340 steels would extend the hardened layer considerably deeper, but cracking would ensue due to the relatively high carbon content (0.38 to 0.43 per cent).

As these steels are limited in the depth to which they may be heat treated by oil quenching, the blocks, even though cast, must be rough machined prior to heat treatment. Processing in this fashion of such components as die holders which are subjected to high pressures has serious drawbacks, for the heat treated surface obtained after rough machining, although hard enough, is relatively thin and simply hides the inadequate back-up structure underneath.

To overcome the limitations inherent in oil quenching type steels, our thoughts were directed towards water quenching compositions which would allow the effects of heat treatment to penetrate much more deeply into the surface of the steel. Another desirable effect of a rapid rate of quench is maximization of characteristics sought through the addition of special constituents to the composition. After several years of research at our East Chicago plant we developed a lower carbon, water quenching composition with the desired balance between composition and quenching rate. This steel, which provides for a hard layer after heat treatment many times the depth obtained with oil quenched 4140 or 4340, has been identified as type C-74.

This is a high hardenability steel whose analysis permits rapid quenching in water and consequent deepening of the hardness layer, without incurring the risk of quench cracking. With this steel and the proper heat treatment cycle, it is possible to cast the approximate shape of the die holder and still arrange for physical hardness to penetrate well below the finish machined surface. Slight variations in its composition have made C-74 an extremely valuable ma-

terial for specific end uses where toughness and ductility are required at high and low levels of hardness. Nominal composition of C-74 is carbon .27 to .29, manganese 1.05, chromium 1.0, nickel 1.0, molybdenum 0.5; minor adjustments in these values have proven to give wide latitude in physical properties. By varying the heat treatment procedure, such physicals as wear resistance and toughness can be maintained at different levels of hardness up to 450 Brinell. When heat treated to lower hardness levels, high shock resistance is imparted to this steel.

In casting a die holder in C-74, we make repairs during shakeout of the mold. Shaking out is itself a carefully controlled procedure, with stress relieving operations performed as often as three or four times during the cycle.

Figure 1 illustrates a 20,000 pound cast die holder having one-half inch of stock for removal to the

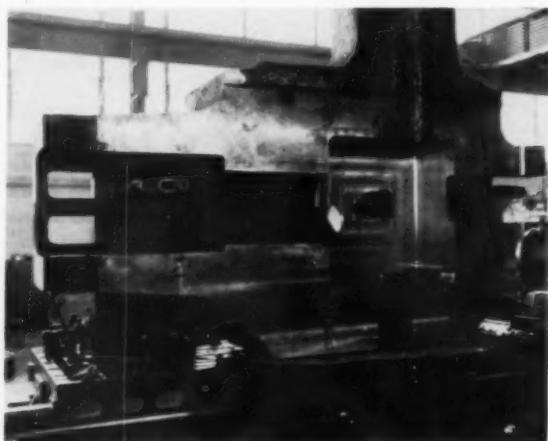


Figure 2. A cast lower die holder being machined.

finished surface. (Figure 2 shows a cast lower die holder being machined.) It may be cast in either oil quenched 4140 or the lower carbon C-74 water quench composition, but since it is cast close-to-size, the holder only requires heat treatment and finish machining when type C-74 is used. Moreover, C-74 gives a deeper and more structurally uniform hard layer after heat treatment, particularly when thick and thin sections are involved, and therefore results in less costly construction practice overall. Needless to say, production of this holder as a forging would be prohibitive due to the amount of "hogging out" required, both in terms of cost and the machining time taken. This latter consideration is of vital significance in such industries as automotive, where the time available for manufacture of tooling is strictly limited.

We at Blaw-Knox have pioneered the introduction of steel castings as the basic building block for large die casting die holders. Although we have not fully explored the area, we believe the same techniques would be valid for considerably smaller holders. We also believe the fundamental technology will ultimately be applied in the construction of many die casting dies.



Plan
to
attend

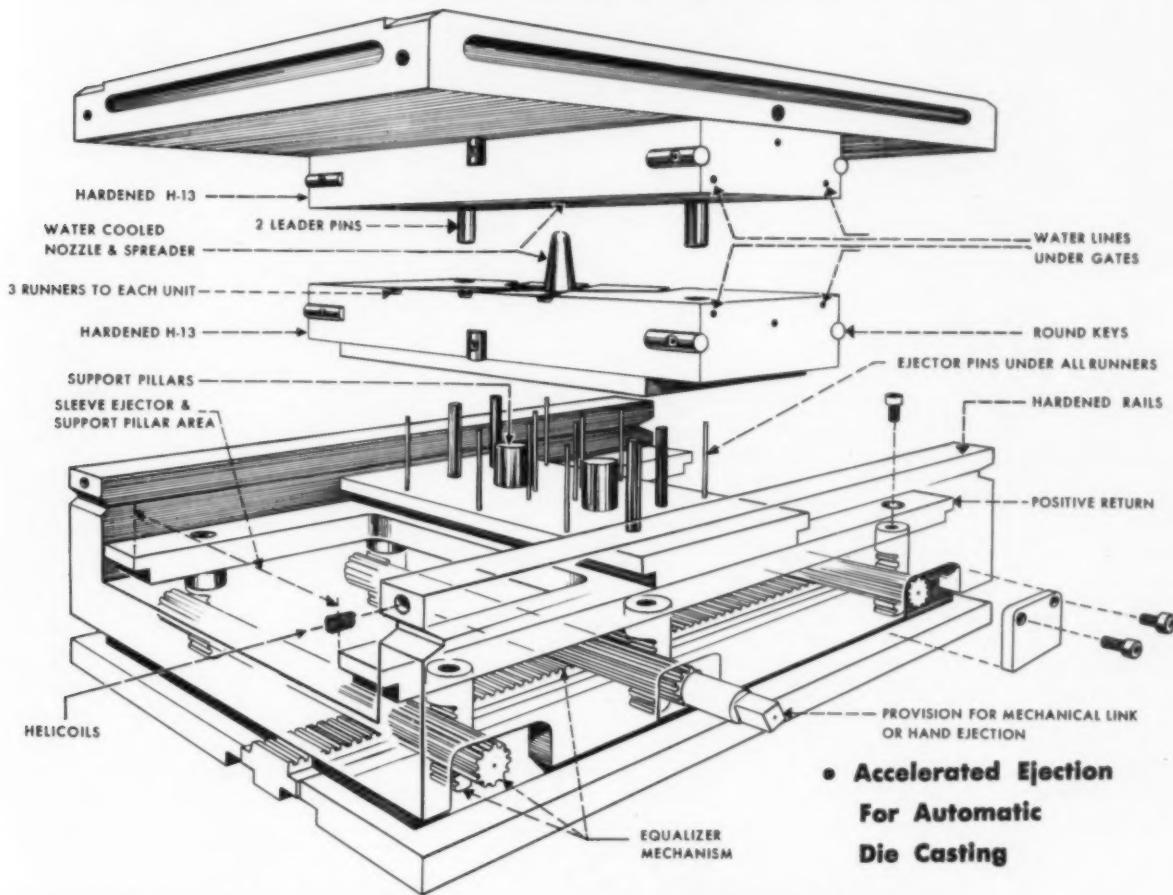
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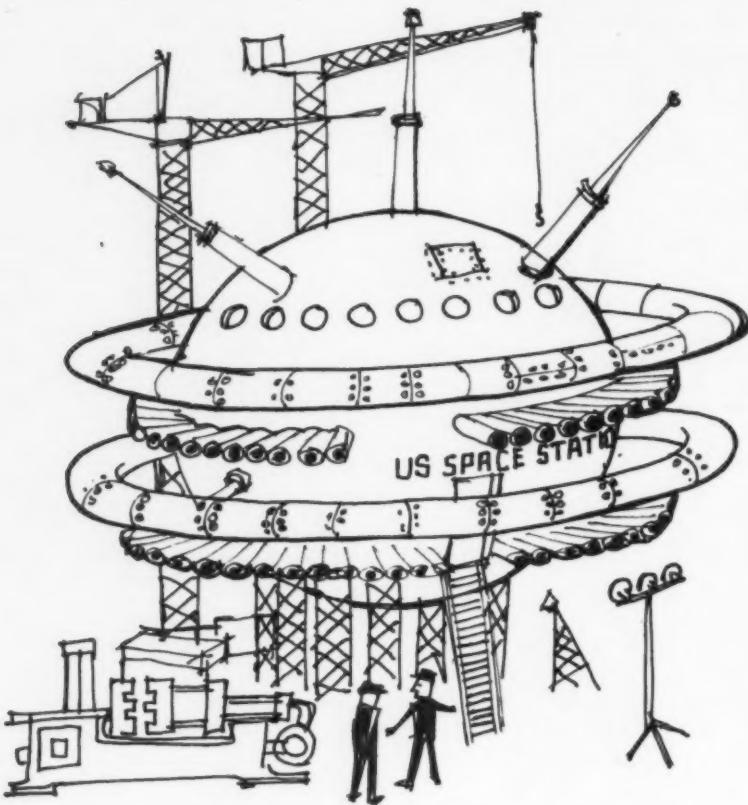
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Second Die Casting Exposition:

September 1962



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Aerial View of Detroit's Cobo Hall and Civic Center

THE SECOND National Die Casting Exposition and Congress will be held Tuesday through Friday, September 25 to 28, 1962, at Detroit's outstanding new convention facility, Cobo Hall. Location and dates were decided from the results of a survey of the 98 exhibitors at the first Show, held at Detroit Artillery Armory November 8 to 11, 1960.

The second Show, like the first, will feature interesting and informative exhibits by suppliers to the die casting industry and producers of die castings. However, coverage in both categories will be broader. A fifty percent increase in the number of exhibitors is expected. Floor area occupied by exhibits should approach 40,000 square feet, double the 1960 Show figure.

A comprehensive Technical Congress will again be presented in conjunction with this second Show. A more extensive program than the first Show's 31 papers is planned to embrace all that is new in die casting.

The first Show established dramatically that the industry wants, needs, and will support an affair of this sort staged at regular intervals. The comment voiced most frequently by those attending was—"my time is being well spent, because the exhibits in this Show concentrate exclusively on equipment, materials, products and services I am interested in." It is the intention of Show Management to maintain this emphasis in the second and future Shows.

Potential exhibitors should initiate now the finan-

cial planning which usually precedes contractual participation.

You who make castings, or are otherwise interested in the die casting industry, should make plans now to visit the Show in Detroit, September 25 to 28, 1962.

ASTME CONVENTION

The 1961 convention of the American Society of Tool and Manufacturing Engineers will be held May 22 to 26 at the New York Coliseum. Featured will be an exposition of creative manufacturing equipment, an engineering conference, plant tours, seminars and a special public affairs program, according to Harry Conrad, ASTME general manager.

AZI 43RD MEETING

Dates and the place of the forty-third annual meeting of the American Zinc Institute have been set. The first session will be held jointly with The Galvanizers Committee of the steel industry (sponsored by the Institute), the second session will be devoted to zinc interests exclusively, and the third session will be held jointly with Lead Industries Association. This year the AZI will precede the LIA meeting, a reversal of the usual sequence of meetings in Chicago.

The dates—AZI, Monday-Tuesday, May 1-2.

LIA, Tuesday-Wednesday, May 2-3.

The place—Drake Hotel, Chicago.

ATTENDANCE AT 1960 DIE CASTING SHOW

A breakdown of the 1960 SDCE Exposition attendance by both industry and personnel classifications pinpoints the prime buying influences that were present. With a total of 5144 registrations, the show was acclaimed an outstanding success in bringing together the largest and most select group of people specifically interested in the die casting industry.

During the four days of the Exposition, visitors

toured through a variety of outstanding exhibits of die castings, die casting machines, dies, die steels, casting metals, production and finishing equipment and die casting supplies and services.

The intense interest in the first Exposition combined with the continued rapid growth of the die casting field promises to make the 1962 program even more vital to visitors and exhibitors.

Title and Industry Classification	Company Officials or Gen. Mgrs.	Purchasing	Plant Mgrs., Supts.	Supervisors, Engineers, Foremen	Sales	Students	Canada	Foreign	Not Classified by Occup.	Total Attend.
Jobbing Die Casters	235	13	177	478	83	2	68	49	19	1124
Captive Die Casters	161	1	139	292	25		8	3		629
Suppliers to Die Casting Industry	437	10	132	322	667		28	42	95	1733
Designer or Specifier of Die Casting	256	7	14	226	6		4	1	4	518
User of Die Castings	254	98	94	497	20		25	9	24	1021
Other	27	1	6	15	7	45	3		15	119
TOTALS	1370	130	562	1830	808	47	136	104	157	5144

GEOGRAPHICAL BREAKDOWN

Industry and Geographical Area	Total Attendance	Industry and Geographical Area	Total Attendance
Mid-American (East)	4315	Iowa	8
Detroit Area	1693	Missouri	61
Michigan	899	Arkansas	10
Wisconsin	38	Nebraska	6
Illinois	709	Kansas	1
Indiana	178	Texas	5
Ohio	749	Colorado	1
Kentucky	32	West Coast	25
Tennessee	5	Washington	2
Alabama	12	Oregon	2
Northeast	407	California	20
Maine	1	Arizona	1
New Hampshire	1	Southeast	19
Vermont	1	West Virginia	3
Massachusetts	29	Virginia	4
Rhode Island	2	North Carolina	8
Connecticut	22	South Carolina	2
New York	130	Florida	2
Pennsylvania	160	Miscellaneous	262
New Jersey	36	Canada	132
District of Columbia	2	Foreign	108
Delaware	3	Unclassified	22
Maryland	20	Totals	5144
Mid-America (West)	116		
Minnesota	24		

SURVEY OF EXHIBITORS

A special polling of the 1960 Exposition exhibitors shows overall satisfaction with the show. Results of this survey as well as personal interviews have aided the SDCE Convention Committee in the planning of the 1962 Exposition.

SUMMARY OF QUESTIONS TO EXHIBITORS

1. Have Services Been Satisfactory?
88% said excellent, good, best of their experience.
5% objected to labor doing work
7% no comment
2. Sales Closed at the Show?
26% said yes
3. Did You Make New Contacts?
All said yes
4. How Often Should Show Be Held?
Every two years 71%
Every year 26%
5. Location of Future Shows?
Detroit 35%
Chicago 33%
Cleveland 23%
New York 3%
Philadelphia 3%
Los Angeles 1%
Pittsburgh 1%
St. Louis 1%
6. Comments
Adjust show hours, fewer evening hours
Badges typed, larger letters on white
More booth depth
More propriety in presentation of some exhibits

Extensive planning and preparation, much of which is already completed well in advance of the Exposition date, promises to make the 1962 show one of the outstanding industrial expositions of the year.

CHAPTER NEWS

CLEVELAND CHAPTER
SPONSORS DIE CASTING
APPLICATION CLINIC

The Cleveland Chapter is planning a clinic to demonstrate to users of die castings the accuracy, flexibility and other special features of the process as related to the requirements of components they purchase. The show, consisting of equi-sized displays of interesting, representative castings by about fifteen Midwestern custom die casters, will be held at Hotel Carter, Cleveland, Ohio, on Wednesday, April 19, between 1 p.m. and 9 p.m.

All those presently using, or contemplating the use of, die castings in their products are cordially invited. Attendance, which is free, will be stimulated through a direct mail program to users and buyers of castings in the Great Lakes region. The mailing list includes approximately 10,000 individuals in over 2,000 user companies.

Qualified representatives from

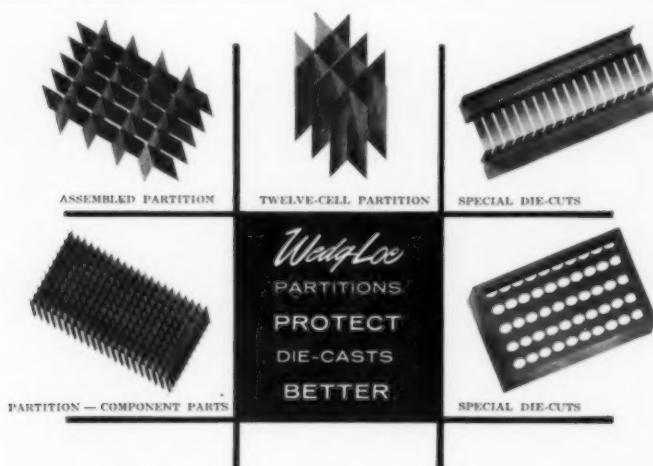
the participating shops will be on hand to answer technical questions posed by buyers, users, product designers and production executives. A color and sound movie depicting basic aspects of the die casting process will also be shown.

The Cleveland group is commended for the imagination and initiative in staging this clinic which, it is hoped, will become one of the broadening services regularly offered to the industry by the Society.

DETROIT

I Jack E. Smith, Die Cast Superintendent of Congress Die Casting, served as chairman for a panel discussion of "Secondary Operations of Zinc Die Casting" at the January 10 meeting of the Detroit Chapter of the SDCE at Devon Gables, Bloomfield Hills. Panel members were Duncan Hannah, Die Cast Die Designer, with Hamco Tool Co.; Don Arnold, co-owner of Class City Tool & Die Co., Toledo; Ludwig Fischly, General Manager, Continental Die

(Continued on Page 20)



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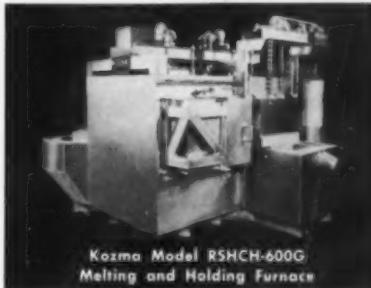
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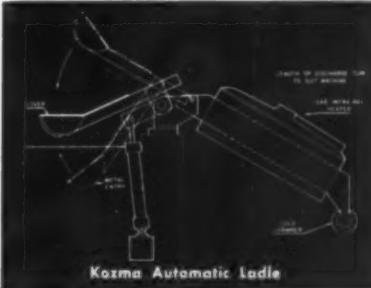


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Write today for complete information on improving the quality of your die castings . . . and reducing your costs.

CHAPTER NEWS

(Continued from Page 19)

Casting; and John Kinne, co-owner of Automatic Die Cast Co., Detroit.

B. T. Anderson, Executive Engineer of Ford and Mercury Engineering, Ford Motor Company, spoke on "Evolution of an Automobile," from conception to release for production, at the Detroit Chapter's February 7 dinner meeting, also at Devon Gables. The March 17 meeting of the SDCE No. 1 Chapter is a St. Patrick's Day dinner dance at Glen Oaks Country Club, 18 Mile Road, west of Northwestern Highway, between Middlebelt and Orchard Lake.

The Chapter's April meeting will feature S. L. Strong, Process Engineer for the AC Spark Plug Division of General Motors, Flint, who will talk on "Magnesium Die Cast Development." Mr. Strong, who was educated at Michigan State University, has been with AC Spark Plug since his graduation in 1956. The dinner meeting will be held at Glen Oaks Country Club

on Tuesday, April 4. Glen Oaks will also be the scene of the Chapter's annual golf outing on July 1, with Carl Barnhouse in charge.

SAGINAW VALLEY

2 The first annual Ladies' Night, sponsored by the Saginaw Valley (Michigan) Chapter of the SDCE, was held at the High Life Inn, Dixie Highway, on January 28. In addition to those listed among the new officers in the January issue of the *Die Casting Engineer* — Roy Lehn, Raymond Smith, Robert J. Peters, and Robert L. McKee, Jr. — the Chapter also elected at its November meeting Robert Carroll, Ternstedt Division, GMC, to be its Historian.

WESTERN MICHIGAN

3 The Western Michigan Chapter of the Society of Die Casting Engineers is holding its March meeting on St. Patrick's Day, the 17th, at the Blythefield Country Club, Plainfield, N. E., north of Grand Rapids. The program includes dinner, the intro-

duction of officers and visitors, and dancing to the music of the Lew Allen Orchestra. In charge of the annual affair is Carl Neuendorf.

TOLEDO

4 Philip R. Kalischer, Editor of Precision Metal Moldings, addressed the Toledo Chapter of the Society on January 10 on the topic, "Where Is the Die Casting Industry Going?"

CHICAGO

5 "Thermolator System on Die Casting" was the topic of H. A. Meyrick's talk to the Chicago SDCE Chapter on January 3 at Nielsen's Restaurant, Elmwood Park, Illinois. Mr. Meyrick, one of the pioneers of the system in this industry through the development and production stage, is the President of Industrial Manufacturing Corporation, Indianapolis.

At the March 2 session of the Chicago Chapter, George Peterson, Secretary-Treasurer and Sales Manager of Micro Deburring Co., Elk

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Grove Village, Illinois, showed slides and spoke on barrel finishing and deburring of die castings. Mr. Peterson helped to found and served as president of the Illinois Deburring Company, which merged in 1958 with Micro. This meeting was also held at Nielsen's Restaurant.

The annual golf outing, scheduled this year for the Glendale Country Club, June 29, will feature an outdoor barbecue and numerous prizes.

The highlight of the Chicago Chapter's program year will be the field trip planned for May. Chapter members and guests will tour the die casting plant of Outboard Marine Corporation's Johnson Motors Division in Waukegan, Illinois. The date will be set later to coincide with Johnson's period of maximum activity, so that visitors will see the operation at its best. Members interested in making this tour are asked to get in touch with Chapter Chairman Warren H. Vormann, Vormann Tool & Die Co., 3514 N. Martens St., Franklin Park, Illinois.

CLEVELAND

6 The February meeting of the Cleveland Chapter attracted a record turnout of 55 members and guests to hear John A. Weber, of Southern Die Casting & Engineering Co., on "The Improvement of Die Castings with Sound." Among those present was John L. McLaren, National President of SDCE. The dinner affair was held on February 21 at Harry Mamolen's Restaurant.

NEW YORK

7 James J. Kux, President of Kux Machine Co., Chicago, and a 24-year veteran in the design and production of die casting equipment, was the guest speaker at the New York Chapter's March meeting. His talk, illustrated with three-dimensional slides, was on the question, "Are Vacuum and Automatic Cycling Mechanism the Essential Ingredients of Die Casting Machine Construction?" Mr. Kux recently returned from Japan,

where he talked to the Japanese Die Casting Society. His New York appearance was at the Hotel Governor Clinton on March 1.

The January 25 meeting of the New York Chapter, also at the Hotel Governor Clinton, featured a panel and group discussion of designing the die, standard parts used to build dies, steel used in dies, requirements of a well built die, heat treatment of die casting dies, and building the die in an outside shop. Guest panelist at the session was Fred Heinzelman, Jr., who has been Vice President and Metallurgist of Fred Heinzelman & Sons, Carstadt, New Jersey, since his graduation from the Polytechnic Institute of Brooklyn with a B.S. in Metallurgy.

The next meeting of Chapter No. 7 will be held on Wednesday, March 22, when the speaker is to be G. Werley of the New Jersey Zinc Company. Librarian and Historian of the New York Chapter is John G. Thomas, of the New Jersey Branch of the Crucible Steel Company of America, West Caldwell, New Jersey.

CENTRAL NEW YORK

8 The Central New York Chapter of the SDCE heard J. B. Kelley, of Die Casters Service, talk on "Why Do It the Hard Way?" at the group's regular meeting on February 28 at the Drumlin's Country Club, Syracuse. Mr. Kelley, whose company supplies hot metal pumps, fluxes, lubricants and plunger tip lubricators to the zinc and aluminum die casting industry, dealt with the various habits and practices that have evolved in the industry and have injured casting quality.

NEW ENGLAND

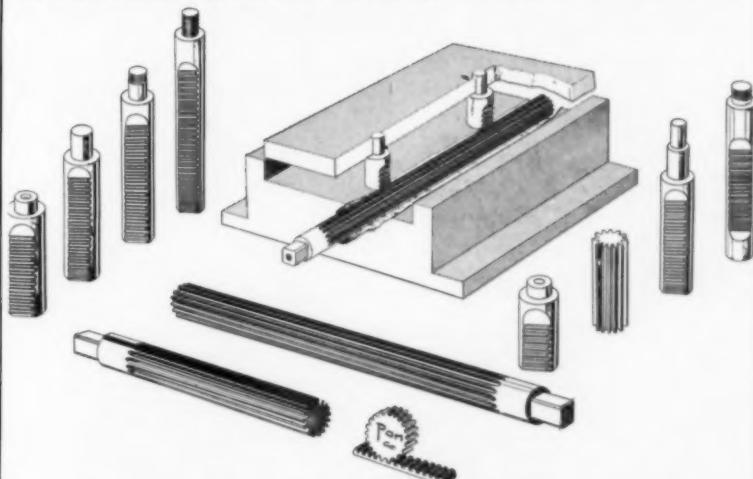
18 Wayne B. Saunders, Vice President of The Mosher Company, Chicopee, Mass., and James J. Kux, President of Kux Machine Co., Chicago, were the guest lecturers at two recent meetings of the New England Chapter. Both sessions, on January 26 and March 2, were held at the Publick House, Sturbridge, Mass.

Mr. Saunders told the 30 mem-

(Continued on Page 27)

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PEOPLE IN DIE CASTING

BRIDGEMAN TO CLEVELAND

Thomas J. Bridgeman, assistant district sales manager for Latrobe Steel Company's Detroit offices, has been named Cleveland, Ohio district manager.

Mr. Bridgeman succeeds M. W. Saxman III at Cleveland, due to the latter's transfer to the home offices at Latrobe, Pa. as general sales manager of the company.

Prior to his assignment to the Detroit office 12 years ago, Mr. Bridgeman worked out of the Chicago office of the company. He is a member of the American Society of Metals, the American Society of Tool and Manufacturing Engineers, and the Detroit Chapter of the Society of Die Casting Engineers.

KOZMA REPRESENTATIVES

The J. A. Kozma Company, Detroit manufacturer of "Radiant" fired melting and holding furnaces for the non-ferrous casting and forging industries, announce the appointment of two new sales representatives.

Louis P. Braemer of Brooklyn, New York will be responsible for the sale of Kozma furnaces in lower New York, upper New Jersey, Connecticut, Rhode Island, and Massachusetts.

The M. A. Bell Co., with offices in St. Louis, Tulsa, and Omaha will represent Kozma in Louisiana, Arkansas, Oklahoma and Nebraska. Mr. L. M. Rose, manager of Bell's equipment division, will be in charge of the Kozma sales program.

PRECISION CASTINGS

The appointment of Robert W. Payne to the new post of Sales Administrator at the Cleveland Division of Precision Castings Company was recently announced by William N. Brammer, vice president, marketing. Payne's primary function is to provide liaison between customers and the factory.

Precision Castings Company produces aluminum and zinc die castings. It is a division of Precasco Corporation, a part of Fulton Industries, Inc., Atlanta, Georgia. Precision plants are located in Cleveland, Ohio, and Fayetteville, New York.

AMERICAN REFRactories

Important management changes were made at a January 4 meeting of the board of directors of The American Refractories and Crucible Corporation, North Haven, Conn.

Most significant are the election of Robert M. Terry of Woodbridge, Conn., to the office of President and Treasurer and Richard L. Matthies to the office of Secretary. Mr. Terry replaces G. T. Hubbell as President and R. W. Brown as Treasurer. Both

Hubbell and Brown have resigned from the company. Mr. Matthies replaces E. B. Boies, who also resigned.

AZI EXPANDS DETROIT OFFICE

American Zinc Institute has just moved its Detroit headquarters to new and expanded facilities, situated at 638 New Center Building, Detroit 2, Michigan; the phone number is TRinity 2-2850.

The Institute's original Detroit offices were established in the Fall of 1958, with James E. Zane as Market Development Engineer. Zane will continue in charge of the expanded facilities.

With broad automotive industry experience including services with the Edsel Division, Ford Motor Co., the Studebaker Corp., and the Packard Motor Co., Zane's functions include technical and educational activities related to the promotion of zinc die casting.

DCE EDITORIAL BOARD

With this issue of the *Die Casting Engineer*, five members of the Society of Die Casting Engineers, are actively participating on the magazine's Editorial Board. These technical consultants are Duncan Hannah, John Lapin, John L. MacLaren, Dean L. Rockwell, and M. R. Tenenbaum. Editor for the bimonthly since January is William White, Professor of Journalism at Wayne State University.

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By EARLE W. REARWIN

THE "ART" of temperature control as practiced on die casting dies is rather abstract. The results obtained as far as casting quality is concerned are very unpredictable.

A study of many problem castings brings out the fact that not only is temperature control in the die left to chance, but there is seldom any uniformity of temperature between the cover half and the ejector half of the die.

A study of such castings shows, in many cases, a good acceptable surface on one side of the casting with a rough and blistered surface on the other side. A cross-section of the casting, examined by etching and magnification, shows a good uniform condition on one side, free of strings and blisters. The other side, however, is rough, blistered, and porous.

There should be no question concerning the importance of scientifically controlling the effect of die

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heat on surface and sub-surface casting structure, but there is a great tendency among die casters to leave die heat sensing and control to feel, or "Art."

I have seen all manner of artful techniques practiced just to sense the temperature. These range from spitting tobacco juice at the die to feeling it with the finger, usually with a glove on.

The control of die temperature is usually attempted by the use of globe valves on water paths which have been channelled in a haphazard manner through the die. Little or no attention is paid to the flow pattern of the water—it may be turbulent, it may tumble from top to bottom of the die, or it may get there just any way.

Regardless of "Art," what is the ideal die temperature? The die temperature should be high enough to always evaporate the light constituents in the die release material. None of the release extender should ever remain on the die surface when the die is closed. The temperature of the die should be high enough to allow good metal flow into the cavity before chilling, and low enough to provide rapid chill and solidification. Both halves of the die must be maintained at as nearly a uniform temperature as possible to avoid chill and roll of the metal. Non-uniform die temperatures will cause misruns, rough surface, and internal leakage.

In cases where the extender has not been dissipated prior to die closing and metal entry, the surface of the casting will have a tiny pebbled pattern on the surface, which is caused by small explosions of the extender when the metal hits it.

Upon examination of the casting, when we find a good surface in the area adjacent to the gate and a poor or rough surface in the further reaches of the die, we know that our trouble is poor heat distribution.

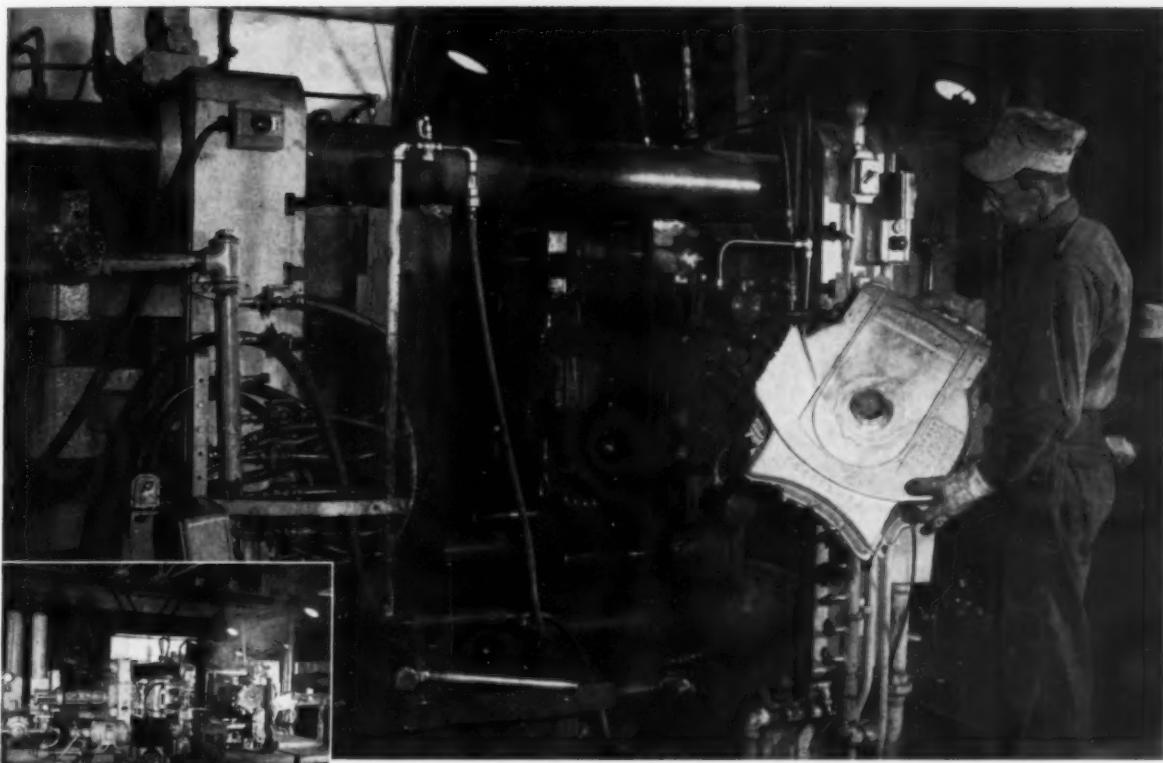
There are much better methods of sensing die temperatures than either tobacco juice or a gloved finger. We should replace some of this "Art" with instruments. Their cost is rapidly covered by reduced scrap if they are used to control. It does no good to know our die is too cold, if we do not take proper corrective action.

Globe valves should be replaced with needle valves and kept in good repair. Water flow pattern in the die should be from the bottom up to avoid the water "falling away" from any area. "Fountains" should be used to temper the water and carry it to the area needed. Aerated water should be used; it absorbs over 30% more BTU's than un-aerated water.

A successful operation uses a low flow of water through the die at all times, with the flow increasing for the duration of each shot cycle by action of an automatic two-flow valve. This avoids a "cold" die during the time no shots are made.

Much can be done to replace "Art," both in the sensing of die temperature, and in the control of die temperature. Again, remove this "Art," make it a controlled function, regulate the variables, and get better casting quality.

Mr. Earle W. Rearwin is Chief Product Engineer for Die Casting, Reed-Prentice Division, Package Machinery Company, East Longmeadow, Massachusetts. Vice President of the SDCE, he is one of the founders of the New England Chapter.



- All operating elements of this efficient 1000-ton Cast-Master are conveniently accessible for instant adjustment or inspection.



- Cast housings are removed from die, inspected and then dunked in the cooling tank at right. Parts are conveyor fed to trimming presses, then drilled and cleaned prior to assembly.



- Minor finishing is required after trimming. The racks in background represent about one-half hour's production for one machine.

• Big, solid 17 lb. castings are housings for rotary power lawn mowers. Production averages 80 housings per hour. This is a 1000-ton Cast-Master Die Casting machine—one of two in this plant.

"CAST-MASTER'S TOGGLE CLAMPING GIVES US UNIFORM DENSITY-LESS FLASH"

G. L. Graft, Divisional Supt. for The Newark Ohio Company Newark, Ohio stated, "We like Cast-Master's die locking toggle mechanism and the rugged qualities of these machines. They've been doing a fine job for us on all sizes of castings up to 17 lbs. each. They're fast; scrap loss and flash are negligible." This company manufactures Kenmore Electric Ranges and Craftsman Rotary Power Lawn Mowers, exclusively for Sears, Roebuck and Company.

If you're moving into the die casting field involving new, larger castings, investigate the Cast-Master line of high production die casting machines—100-ton to 2000-ton capacities—cold chamber or hot chamber models. Write for Bulletin CM-100.

H26

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26

The Rayniak Story

(Continued from Page 11)

essed into die castings comes from two main sources: a portion of the material is purchased from the various smelting companies in the form of ingot, the balance is purchased on the open aluminum scrap market. The scrap is very carefully selected and only alloys of high purity are used. A good portion of this material is in alloys 2S and 3S in the form of stamping trimmings from the food processing industry.

Once the raw material has arrived at the Johnson plant, frequent samples are taken during the unloading process for analysis. On the basis of these results, the large melting furnaces are charged with scrap and various other elements to bring the melt to a specific Johnson Division alloy. Prior to removing molten metal to the die cast machine, a sampling is taken from the melting furnace and sent to our laboratory for analysis.

The complete process can be accomplished in approximately five minutes due to quantometer and other laboratory facilities. The approved analysis is posted and the furnace melt is poured into a ladle and conveyed to the die cast machines via an overhead monorail system.

In addition to the quantometer for metal analysis, the metallurgical laboratory is equipped to maintain quality control in other areas. Complete X-ray and dark room facilities are in daily use as a standard part of the inspection procedure on a large number of production die castings. Sample castings are X-rayed at the beginning of each shift. The results of this inspection procedure are then returned to the die cast machine prior to the removal of the die castings to secondary operations.

The testing of castings for tensile strength is a quality control measure that is conducted in a somewhat similar manner to that of X-ray. Certain functional parts must withstand a pre-determined amount of stress.

Sample castings are taken from the die cast machine at the begin-

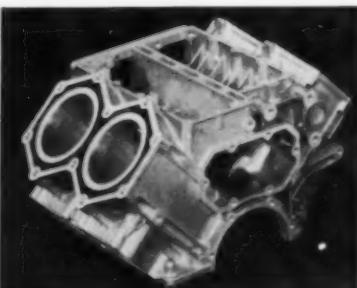
ning of each shift and sent to the laboratory. Here they are physically broken in the tensile testing equipment. The stress applied to break the casting is recorded and compared with the pre-determined standard. As in the case of X-ray, the castings at the die cast machine are not processed for secondary operations until the report returns from the laboratory, stating that the standards have been met.

In addition to laboratory quality control, each casting is inspected by the die cast machine operator during the solidification time of the next casting produced. The inspectors on the floor examine the castings prior to removal from the die cast machine area. Supplemental inspection procedures done by line supervision and various technicians, keep a constant surveillance on casting quality.

WARTIME AND POSTWAR

During the years of World War II, interesting and challenging die cast projects were developed in conjunction with our defense effort. Many aircraft quality castings were produced for the government in both the aluminum and magnesium die casting alloys. Among these castings were the cabin supercharger for the B-29, the oxygen regulator, and numerous aircraft instruments.

When peace was once again restored, outboard motors were restyled and many new features incorporated. Much like the automo-



Johnson Motors' V-4 Engine Block Casting

tive industry, the engines grew in size and horsepower. These changes generated large tooling programs over a number of years.

Such die castings as the large

motor covers, the one-piece aluminum lawn mower housing and the first die cast V-4 engine block were developed. To improve quality and physical properties, the aluminum-magnesium alloy #218 was cast into propellers and various other functional parts.

NEW FRONTIERS

During this period a number of frontiers in the world of die casting have been probed. We have worked in close collaboration with some of our friends in the steel industry to encourage the production of large tool steel forgings so that we might build dies to produce large castings free of seam lines and extra secondary operations. A portion of our castings are produced on machines equipped with the latest advances in vacuum techniques.

Over the years we have been honored by visitors from numerous American companies and many management people representing friendly foreign concerns. We feel it is the unrestrained free exchange of technology that will keep the die casting industry strong and open the avenue to new markets and new products.

The industry as a whole is still in its infancy, with untold rewards awaiting those in the automotive field and other consumer products who are bold enough to venture forth and tap these resources.

Great advances can be made through the concerted efforts of industrial technical organizations like the Society of Die Cast Engineers. The rewards derived from for-

ing ahead can mean increased employment and an even higher standard of living for the American people, and the people of the entire world.

CHAPTER NEWS

(Continued from Page 21)

bers who attended about barrel finishing and deburring of die casting. He pointed out that the cost factor of the finishing operations is given too little thought initially, and explained how much could be saved in manufacturing costs. The meeting was supplemented with representative die castings tumbled by two principal pieces of equipment—the typical rotating type of barrel and vibratory machines. The vibratory method of tumbling, being relatively new, created considerable interest, as did the demonstration of two small model machines presenting each type of tumbling.

Mr. Kux's talk, heard by about 40 members, covered the features of his company's machine. He discussed the effect of hydraulic shock waves in the system, the problems involved in the use of non-inflammable fluids, the high pressures and high velocity in the hydraulic system. The speaker also pointed to the uselessness of spool versions in certain circuits, the features of the supporting base on the alignment of the plunger arm, and such accessories as vacuum cast systems. He used three-dimensional slides to show his machine.

Earl Erwin and Frances Kennedy spoke about the 1962 Die Casting Congress, taking up the submitting of papers to be read at

the coming Show and the success of the first Congress.

INDIANA

25 The March meeting of the Indiana Chapter was held on the 9th, beginning with dinner at Casa Grande Restaurant, Kokomo, and followed by a short business meeting. After that the members took a trip through the Chrysler Casting Plant, one of the most modern aluminum die cast plants in the midwest. Among Chapter

(Continued on Inside Back Cover)



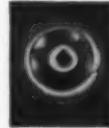
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New Literature, Products, Ideas

DIE STEEL BULLETIN

Lindberg Steel Treating Company has announced the availability of a Metallurgical Bulletin which reviews heat treatment and related problems in die casting die steels.

As the busy die caster cannot find time to wade through the vast amount of data furnished by the suppliers of die steels and other writers of technical papers on this important subject, the authors have made an attempt to catalog the factors contributing to die failure, based on nearly twenty years of heat treating service. Die failures are costly, and it is believed that such a study of possible causes for failure, along with a basic review of die steel and heat treating metallurgy, will serve as a useful reference.

This Metallurgical Bulletin, authored by D. R. Edgerton and N. O. Kates, may be obtained by writing Lindberg Steel Treating Company, 1975 North Ruby Street, Melrose Park, Illinois.

NEW PAR-VIN FITTING

Par-Vin Company, of Batavia, New York, announces a new Style "Y" Single Return Water Line Fitting. Where it is impractical or impossible to have a through water line in a die or core, this single return style fitting allows bringing cooling water directly to the area that is running too hot. Cooling can be di-

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- 3—A. B. C. air operated with four 1" diameter tie bars, 1957 several Kux BH-12 (hydraulic) and BA-12 (air operated) 80 ton
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1313 Kalamazoo St., South Haven, Michigan

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28

rected to areas such as gate, runner, and heavy casting sections, side core pull, and set-in ejector cores and cover dies.

In operation water is directed through a copper tube that is inside the sand cast aluminum fitting. The copper tube extends into the area to be cooled. The water is returned in the area between the ID of the standard pipe and the OD of the copper tube. It will operate at normal water pressure.

1962 FOUNDRY CONGRESS

Further evidence of American interest in foreign markets comes from an announcement by the American Foundrymen's Society, Des Plaines, Illinois, international technical society for the metal casting industry. The 29th International Foundry Congress has been scheduled for Detroit's Cobo Hall in May 1962, to coincide with the 66th AFS Castings Congress and Exposition. At this event, the AFS will play host to the entire International Association of Foundry Technical Committees, comprising technical groups in 22 countries around the world.

INDUCTION HEATING BULLETIN

An eight-page bulletin on Induction Heating and Melting Equipment is available from the Ajax Magnethermic Corporation, Youngstown, Ohio. Subjects include: low and high frequency melting; frequency converters and accessories; vacuum melting and degassing; induction billet heaters for aluminum, copper, steel, titanium, uranium and other metals; charts on selection of proper frequency and melting rates in pounds per hour. Write Ajax Magnethermic Corporation, Youngstown 1, Ohio.

GAS POROSITY

A four-page bulletin discussing the problem of gas porosity in aluminum castings and listing the specifications of Foseco Degaser has just been published by Foundry Services, Inc., Cleveland.

The brochure describes the properties of all four grades of Degaser, three of which combine a moderate grain-refining action with degassing in a single-step process. The bulletin also provides tabulated application data and recommended quantities of Degaser by weight of melt.

The brochure, designated as Leaflet No. B-2, may be obtained from Foundry Services, Inc., P.O. Box 8728, Cleveland 35, Ohio.

NEW PACKER CO. FOLDER

Eight basic types of automatic polishing and buffing machines produced by the Packer Machine Co. 456 Center Street, Meriden, Conn., are described in a new illustrated folder offered free by the manufacturer.

The machines are of the rotary indexing, continuous rotary, horizontal conveyor and straight line

(Continued on inside back cover)

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DIE CASTING SERVICES AND PERSONNEL OPPORTUNITIES

Space in this section is available at \$10.00 per column inch (1" x 2 1/4") or any fraction thereof, payable in advance. Closing date: 15th of month preceding publication.

To answer Box number advertisements, address response to: Box . . . , Die Casting Engineer, 19382 James Couzens Highway, Detroit 35, Michigan.

MANAGER WANTED—Have you ever operated a die casting machine? Have you worked in the engineering and sales end of a die casting plant? If you know how to do these things efficiently and successfully, we have a good job for you as an over-all die casting manager in a plant now handling \$1,000,000 in sales and with the capacity of doing \$2,500,000 in sales. Write Box 127.

NEW LITERATURE

(Continued from Page 28)

conveyor type. Information on each of the units includes the number of heads available, work table or conveyor size, number of work holding spindles, production rate output and the type of work piece each machine is best suited to handle.

LORCO INTRODUCES VIBRATOR

Addition of a 1 cu. ft. Vibrator finishing model that can be tilted for rinsing while still vibrating has been announced by Lord Chemical & Equipment Division of Wheelabrator Corp., York, Pa. Designated the HD-1016 Vibrator, the new model is 10" wide, 16" long and 13" deep, with 1/2"-thick rubber lining throughout. The machine contains a variable amplitude shaft, adjustable from 0-1/4" amplitude. The frequency is variable within a range of 700 to 2100 cycles per minute.

CHAPTER NEWS

(Continued from Page 27)

members associated with the Chrysler Plant are Andy Perejda, James Robinson, and Jerry Scruggs. Host for the visit was Plant Manager Harry E. Eriksen, a past National President of the Society. Present as well were John L. McLaren, current National President, and Ollie Clayton, last year's President.

Indiana's April meeting will be held April 13 in Anderson, Indiana, when John Weber of Southern Die Casting and Engineering Co., High Point, N. C., will address the Chapter on Sonics in Die Casting.

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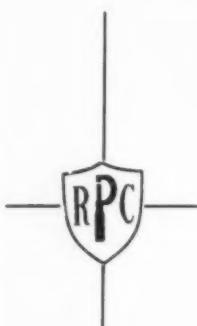
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